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ABSTRACT

Intended for teachers of students with learning disabilities, the paper reviews recent trends in research. The importance and the difficulty of keeping up with new developments in the field are noted. Research and theoretical considerations are presented for the following topic areas: definition and identification difficulties (including, subjective variance in interpretation), reading (including, acquisition processes, comprehension theories), psychology and artificial intelligence (including, theories of scripts as the organism's information storage systems, J. Piaget's developmental perspectives), special education (including history of services to learning disabled (LD) students), language acquisition, classroom instruction, attention deficits, home factors (e.g., effects of the child's environment that contribute to the LD condition), hyperactivity (e.g., environmental factors). Applications of the theoretical orientations are examined for reading processes, attention and comprehension, and teaching and the comprehending process. A seven-page reference list is included. (CL)

Learning Disabilities: A Practitioner's Scriptal Accommodation of More Recent Trends

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Abstract

Special educators who are removed in time or distance from their training may not have the opportunity to keep current in the field. This is especially critical for practioners who serve learning disabled students. As a result of research, theoretical orientations have changed considerably over the past ten years. These changes reflect contributions from the related fields of psychology, reading, language, and medicine. In spite of this increased interest in the literature, an agreed upon definition has yet to be accepted by all groups who are involved with these children.

In this paper an attempt has been made to accomodate various theoretical positions, in light of different learning problems encountered with L D chilren. These suggestions have been generated in a rural Montana resource center serving kindergarten through sixth grade students diagnosed as L D.

In examining "more current trends" the goal is to encourage practitioners to adopt a logical theoretical framework on which to base their instructional activities. It is contended that without such a framework, teaching techniques and strategies cannot be satisfactorily critiqued nor can information be added to the study of L D. Several practical applications are suggested at the conclusion. However, special educators are

encouraged to assess the info ·tion surveyed here, make their own accomodation in light of experience and instructional needs, and share their findings in a similar fashion.

Learning Disabilities: A Practitioner's Scriptal Accomodation of More Recent Trends

Special education teachers are not always afforded the opportunity to study about the student subpopulation with which they are instructionally involved. Consequently, teachers are less apt to relate the broad base of current theory, strategies, and applications, described in the literature, to their educational programs. Evidence seems to indicate that special educators do not have the time and/or opportunity to keep abreast of the most recent research in their field. Arter and Jenkins (1977) considered a group of special education teachers' appraisal and implementation of modality training as an instructional tool for disabled learners. They found that the teachers' opinions significantly reflected an affiliation with their training institution.

This observation calls into question teacher awareness of current reported findings in that 99% of the survey respondents felt the student's "modality should be a major consideration when devising educational prescriptions" (p. 293) while "research evidence fails to support the practice" (p. 295). Considering the abundance of debate over the modality issue in the professional publications (e.g. Barbe, Swassing, & Milone, 1981; Kampwirth & Bates, 1980; Smead, 1977; Tarver & Dawson, 1978) it would be hard to justify such

overwhelming allegiance to this weakly supported position today.

This paper will attempt to coordinate some current information on learning disababled students to its practical application in a resource center model delivery system. The paper resulted from an independent course of readings assembled under the direction of the writer's doctoral advisor. The resource classroom referred to here is designed to provide services to students who have been identified as learning disabled by a child study team. As such, it is part of a kindergarten through sixth grade school located in a small town (population 5000) in northwestern Montana. Delivery programs consist of direct instruction, augmentation of regular day classroom lessons, motivational programs, and strategies designed to promote thinking and problem solving. Pupils attend sessions three to five days per week, ranging from twenty-five minutes to one hour blocks of time. The majority of students receive instruction solely in the area of reading.

Definition and Identification Difficulties

It would be difficult to begin discussing learning disabilities without some clear indication of what the term presently describes and how it is applied. Whereas a definition is contained in Public Law 94-142, interpretation has not yielded overwhelming agreement

among persons in the field. A learning disability "is anything you want to make it that is non-qualified by another statement of exclusion" (Sabatino, 1983). The January, 1983 issue of the Journal of Learning Disabilities (volume 16 [1]) has devoted 25 pages to the definitional issue in an attempt to demononstrate how diverse expert thinking is on the subject. An example will serve to illustrate the current situation.

In reporting on two surveys, one conducted in 1975 and the other in 1981, Tucker, Stevens and Ysseldyke (1983) found opinions on learning disabilities relatively consistent over time. The subjects polled were considered, in the eyes of their peers, to be "on the cutting edge' of research and programming" (p. 6). The 1981 sample overwhelmingly (82.6%) affirmed the opinion that the classification L D was viable. Similarly, the sample concurred that the L D determination could be made based on "specific symptoms or by a constellation of various symptoms" (p. 8). These symptoms distinguish the L D child from the mentally retarded and slow learning student.

Less apparent, was agreement over specific symptoms or identifiers of this condition. Herein lies the difficulty in the field: the identification of the L D condition. Tucker et. al. summarized by stating "the survey results point to the current needs in the field. Definitional

issues are at the base of these needs" (p. 13). Sabatino and Miller (1980) noted that after two decades of attempting to identify learning disabled students, a precise definition has yet to be forthcoming. Local education agencies have little trouble identifying hearing impairments, visual defects, and mental retardation. However, the identification process for L D students is contingent upon the state in which the evaluations are performed, and even within states, may fluctuate depending upon L E A procedures.

Researchers and practitioners alike concur that a more mutually agreeable definition is needed and recently an attempt has been made to coordinate various service groups in generating one (cf. Hammill, Leigh, McNutt, & Larsen, 1981). Six national organizations, each belonging to the National Joint Committee for Learning Disabilities, have agreed upon a new definition of learning disabilities. Citing their rationale for differences between the new definition and the one lisred in P. L. 94-142, Hammill et. al. concluded that it "is a substantial improvement over existing ones...(yet)...in the years to come, their effort will be discarded in favor of a newer, improved version" (p. 341). This statement reflects a realization on the part of the writers that special educators do not have a clear grasp of what learning disabilities really are. The newer definition states:

Learning disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomittantly with other handicapping conditions (e.g. sensory impairment, mental retardation, social and emotional disturbance) or environmental influences (e.g. cultural differences, insufficient/inappropriate instruction, psychogenic factors), it is not the direct result of those conditions or influences. (p. 339 - 340)

After studying this definition, special educators might wonder how it enhances the diagnosis and delivery of educational services to the child. The question still remains for some - against which standards does the teacher measure skills for the purpose of determining if a "significant" deficit exists (McLeod, 1983)? What constitutes a sigificant deficit? By which means can a "central nervous system dysfunction" be presumed and on what evaluative basis is this C N S dysfunction presumed? These questions illustrate that the new definition still leaves ample room for

interpreting learning disabilities with a great deal of subjective variance. Excluding poor academic performance, which is the single trait that best characterizes L D students "we have failed to identify the characteristic(s) which is universal and specific to L D" (Ysseldyke & Algozzine, 1983, p. 30).

While the prospect of a generally agreed upon and empirically testable identification procedure may appear remote, special educators are mandated to assist in diagnosing and providing individual educational programs for these students. Teachers can hardly work with L D children on a daily basis without generating a perspective on the validity of what is currently written on the subject. More importantly, an observer might legitimately wonder if this condition is truly identifiable as a distinct entity exclusive of subjective (and sometimes political) factors which can be brought to bear in child study team decisions.

Special education has recently been questioned as a profession (Birch and Reynolds, 1982). If one goal of special education is to build a fund of knowledge which will more consistently yield instructional excellence it will be based on the professional application of empirical research which, in turn, reflects a systematic theoretical development. Consequently, practitioners in the field should be encouraged to employ measurable assessment and

instructional techniques which reflect this organized perspective. Information generated in this manner should be shared among one's peers so that successes and failures might be considered as they contribute to a clearer discussion of what is and is not L D. Further, this assessment and instructional strategy should reflect a systematic and logically constructed theory.

Theoretical Consideration

For practitioners who are intent on improving services to disabled learners it becomes evident that these children comprise a heterogeneous group. Not only do they vary in the degree of difficulty encountered when they attempt to learn but factors like activity level, word attack skills, mathematical reasoning, planning and thinking strategies, organization and comprehension skills, memory for details, social ability, and a willingness to work all serve to characterize different subsets of individual children. The decision which practitioners must make after reviewing the literature on these aspects is which of the competing theories on L D are the most reasonable and applicable to their classrooms.

Likewise, one's acceptance of a theoretical position and its implications for treatment should reflect a broader philosophical perspective on the thinking and learning process. Consider the recent abundance of information generated in the area of cognitive behavior modification

and the application of Piagetian developmental principles to learning. Both positions reflect a perspective of the learner as more actively involved in the learning process than that espoused by strict behaviorists. How educators consider the individuals whom they serve will ultimately influence which position they will adopt. In short, at the heart of effective identification and instruction are the teacher's theoretical and philosophical bases. It is incumbent upon educators to recognize the role that these bases play in the daily activities of the special classroom.

Wong (1979a, 1979b) examined early as well as current theories of learning disabilities. She pointed out that research is dependent upon understanding the framework of a theory and evaluating that framework from a given perspective. Wong quoted Senf as saying "understanding deviant functions of learning-disabled children comes from having a coherent theoretical framework, which directs systematic investigation and which integrates the obtained data meaningfully" (1979a, p. 20). In addition, she stressed that sound theory affords the practitioner a standard against which to evaluate various methodologies to determine their effectiveness. It is the position taken here that to the degree that special educators are in tune with a testable, theoretical perspective on L D will be the degree to which instruction will be open to

improvement. It is conversely suggested that the adoption of unrelated and random instructional procedures, ignorant of contributions from related fields of education, psychology and medicine, adds little information to the fund of knowledge on L D. This second attitude guarantees the maintenance of the status quo in the field.

Reading

Since special educators find that many of their learning disabled children have difficulty with reading it seems logical to sample the reading literature to get a broader theoretical perspective on this process. Understanding how children develop an ability to read is an appropriate starting point in the search for factors which define the L D population and effective remedial programs. However, as with the definition of L D, this issue has prompted considerable debate among reading experts. Shafer, Staab, & Smith (1983) traced the development of language acquisition theory as it relates directly to reading acquisition theory. They concluded that the ability to both read and write stems from the individual's ability to talk. But, whereas language acquisition is a natural process which undergirds the development of reading skills, reading is not a naturally acquired skill.

Johnston (1983) has suggested two dimensions along which reading acquisition can be characterized. The

first dimension considers the reading process as a "bottom up" phenomenon. Here, the reader constructs meaning by putting together the written components of language. Instruction which focusses on this dimension stresses phonics. Processing difficulty in this dimension is embodied in the disabled reader who struggles with a difficult printed passage written on grade level. The student attempts to sound out and blend together the phonetic components of the text in an effort to generate some meaning.

"Top down" processing, on the other hand, "requires a previously formed knowledge structure which already contains major relationships. This is described as a 'slot filling' activity" (Johnston, 1983, p. 7). This dimension of learning to read is evident in children who are able to locate signs which indicate a McDonalds or K-mart as they travel, though they may be unable to render correctly all the combined letter sounds for the words. For the disabled reader, dependent mainly upon this strategy, it results in the generation of an outlandish story from a few pictures contained in a text. Henderson and Green (1969) have pointed out that this dimension of reading is indicative of the human determination to generate meaning for and from experience. L. Williamson (personal communication, July, 16, 1983) has contended that the acquisition of reading skills

is dependent upon both "top down" and "bottom up" capabilities and as such is an "idiosyncratic" phenomenon.

As they attempt to remediate learning difficulties, what information can special educators glean from the reading experts? Citing the National Institute of Education's 1976 interest in reading, Pearson and Johnson (1976) have quoted "reading research appears to have shifted away from an emphasis on decoding and methods of teaching reading toward an emphasis on understanding how readers comprehend and how we can help students comprehend better" (p. 24). If the goal of reading is comprehension, the development of component skills which fosters comprehension should be the goal of special educators who work with reading disabled students.

However, an underlying consideration needed to be evaluated at this juncture is how reading comprehension is perceived. Johnston (1983) suggests that comprehension can be corsidered either divisible or indivisible. If comprehension cannot be divided into subskills, there is little that instruction can achieve for the individual learning to read. However, if comprehension is divisible, subprocesses can be targeted for appropriate training. This second approach is recommended here for implementation in the resource program for L D students because it extends a promise for remediation. What are these subskills

that contribute to reading comprehension? An examination of general comprehension can provide some insight.

The contention that comprehension is divisible is paired with the conviction that reading is a process related to thinking and is "inextricably intertwined" with the memory process (Royer & Cunningham, 1978). Pearson and Johnson have summarized this position:

> In short, it should not surprise you to learn that many experts think of reading comprehension as similar to other kinds of human behavior. In fact, most of us would reject the argument that we have separate mental entities for processing and comprehending information received by reading (as opposed to listening or experiencing). Intuitively, we believe that the human mind is built as economically as possible (religious or not, we believe that God [or nature] operates on a principle of economy of effort). Hence, we might be convinced that the mind has special 'perceptors' or processes for recognizing print, but we would be skeptical of any 'comprehendors' specifically suited to information gathered by reading the printed page. It just does not make good sense!

If our agrument is convincing thus far, then you will probably accept this assertion: Whatever influences general thinking or problem solving ability also influences reading comprehension. (p. 8-9)

From this position we may conclude that reading comprehension is only one application of comprehending in general. Thus, factors which foster improvement in the broader area will produce similar effects in the other. Pearson and Johnson have noted further that comprehension is "building bridges between the new and the known" (p. 24). They point out that this "simple metaphor" is indicative of three things. First, comprehension is an active process which requires involvement by the reader. Second, comprehension requires the reader to generate a tremendous number of inferences. Third, reading comprenension involves a dialogue between the reader and the writer. These points serve to illustrate the active nature of comprehending. Their implications for instruction will be considered later when the L D student is characterized as an "inactive learner". However, our emphasis now turns to the contribution of psychology and artificial intelligence in describing the thinking process as it relates to learning.

Psychology and Artificial Intelligence

Cognitive psychology and artificial intelligence are two fields which offer educators a theoretical insight into the learning process. As was observed about the reading literature, theoretical and research perspectives generated in psychology and A I can serve to shed light on the atypical learner. Research has indicated that the L D child lags

behind the typical learner on developmental tasks (Anderson, Richards, & Hallahan, 1980). A learner's past experiences form the foundation for new experiences in an ever increasing spiral of meaning development. Pulaski (1971), explaining Piaget's developmental theory of learning, has contended that adaptation is at the heart of intellectual functioning. The organism interacts with the environment from the moment of consciousness, adapting the information which enters through the senses in relation to what has previously been experienced. Bovet (1981) has noted that this is an organically directed process and has cited Piaget: "Cognitive processes seem ... to be at one and the same time the outcome of organic autoregulation, reflecting its essential mechanisms, and the most highly differentiated organs of this regulation at the core of interactions with the environment... (Piaget, 1971, p.26)" (p. 1). Bovet continued by suggesting that Piaget's position reflects an "interactionist" point of view. In other words, the organism, through experiences, shapes and is shaped by its dynamic interactions with the environment.

At the heart of this learning process is augmentive equilibration, "which makes the hypothesis that all cognitive progress arises from the 'depassement' (going beyond) of phases of disequilibrium" (Bovet, 1981, p.3). The learning organism can be perceived as

constantly striving to resolve the dissonance between what is stored in the reservoir of experience and what is newly experienced. The newly acquired information about the world is categorized into an ever broadening series of schemata which serves to represent and shape the world for the learner.

The mind's ability to handle this ever changing fund of information on the world has also been considered in the field of artificial inteiligence, the branch of computer science which attempts to model human thinking in computers. The organism's information storage system has been described by a theory of scripts. Kendig (1983) has written in his introduction to an interview with artificial intelligence pioneer Roger Schank "Schank and Abelson developed the theory of 'scripts' based on the idea that memory is organized by lists of generalizations and expectations" (p. 30). Thus, a script resembles the schemata hypothesized in Piagetian theory (Pearson & Johnson, 1976), and as such, constantly changes as a result of myriad interactions in the learning situation (Bovet, 1981).

Scripts can be described as the experiential knowledge contained within, which serves to shape how the world is perceived. The learning organism encounters a word, object, situation, memory, song, etc. and previous occurences shape how that stimulus is perceived. In

the Piagetian view, if the encounter is consonant with stored information about similar stimuli, the new data is assimilated. If not, the schema which exists in the learner must somehow accomodate the new information. The individual's current knowledge for a particular situation is a reflection of the script generated for that situation over time. Schank stated that "A script is a set of expectations, a codified set of information that seems to be associated in the mind with a particular event and that allows the inference process to be constrained" (Kendig, 1983, p. 32). For Piaget, learning is evident when the organism assimilates what fits and accomodates that which does not. Schank has emphasized the second dimension of this learning diad. When dissonance is created between what is observed and what is expected learning tends to take place. In addition, it is suggested here that a degree of activity is required on the part of the learner to resolve this dissonance.

These theoretical perspectives on learning apply to the human organism throughout its life, and do not remain solely in the domain of factual learning. Pullis and Smith (1981) have applied Piaget's developmental perspective to the social domain. Noting that L D children exhibit significant difficulty with social competence, they have suggested that this difficulty is commensurate with their cognitive development in this area, that is, how "these

children come to think about and understand the dynamics of interpersonal interactions" (p. 44).

It has been stated earlier that the L D population can be described as heterogeneous. The contribution of the aforementioned theories is that they emphasize the developmental aspect of learning and, as such, provide a consistent standard against which deficits can be more easily understood. However beneficial this might be to understanding disabled learners, it fails to consider whether their difficulties stem from organically determined factors or if these difficulties are more a function of the learner's environment. In the next section, this paper will attempt to consider how the L D student has been characterized by theories developed in special education literature.

Special Education

An understanding of current trends in the area of L D relates directly to an understanding of how this position developed historically. Although this material is considered under the subheading Special Education, it is drawn from a wide spectrum of related fields including education, psychology, neurology, rediatrics, and language.

In a brief historical overview of these developments it becomes evident that the earliest theories of L D considered the organism (the child) to be defective in some fashion. Wiig (1982) observed that "language and

learning disabilities are often implicitly assumed to be caused by neurological and physiological factors" (p. 276). Lerner (1971) has pointed to the work of Werner and Strauss, in the early 1940's, as the inception of the movement to understand the L D child. Based on this pioneering research, a theory was developed which stated that these children were suffering from some form of brain injury. Lerner quoted Stauss and Lehtinen as she traced the historical development of L D:

> The brain-injured child is the child who before, during or after birth has received an injury to or suffered an infection of the brain. As a result of such organic impairment, defects of the neuromotor system may be present or absent; however, such a child may show disturbances in perception, thinking, and emotional behavior, either separately or in combination. (p. 14)

This description, which later led to a descriptive constellation of behaviors called "Strauss syndrome" emphasized that the brain injury was "exogenous", that is, caused not from genetic determinants but from an injury.

Cruikshank and Hallahan (1973) pointed out that the exogenous claim

> ...attracted cogent and vehement criticism. Nevertheless, regardless of the true etiological classification of their exogenous group, the

important consequence of Strauss and Werner's research was that it demonstrated the existence of a subgroup of mentally retarded children, many of whose behaviors were not within the repetoire of the majority of mentally retarded children. (p. 324)

In response to the brain injury orientation the term "minimal brain dysfunction" was advocated by Clements to describe this subpopulation. Cruikshank (1966) countered with his position that the fact that no injury was currently determinable with existing methods did not preclude its occurrence.

Learning disabilities. In 1962, the term "learning disabled" was coined by Kirk who noted that the condition was a result of "a possible cerebral and/or emotional or behavioral disturbance" (p. 263). This statement reflected a change in orientation from perceiving the disability as result of purely exogenous factors to the inclusion of endogenous and behavioral factors. No longer was an injury presumed, but developmental delays and environmental and genetic determinants were also included as possible contributing components leading to atypical learning. At this time perception began to attract attention as a deficit area for the L D learner, causing distortions which presumably affected reception of academic material, particularly in the reading area.

Central nervous system factors. Without actually

exploring the central nervous systems of L D children, the dysfunctions previously described were not empirically identified. This, in itself, prompted considerable controversy in the field. Hallahan and Kauffman (1974) have characterized the position adopted by special educators and psychologists during this period as skeptical of the medical model in describing L D. The medical model attributed an organic basis to the learning difficulties. Behaviorally oriented practitioners contended that this was essentially unable to be proven and focussed their attention on treatment, implementing academic training programs based on behavioral principles.

For those who retained the medical model, soft signs were indicated as illustrating the neurological involvement underlying the learning disability. A post-traumatic loss of the ability to read in an adult who had suffered a head injury, served to lend credence to this position. Wiig (1982) referred to a case study done by Galaburda & Kemper in 1979, where, in an "in-depth post-mortem examination of the brain of a 20-year-old dyslexic man... They found islands of primitive and abnormally large cortical cells in clumps of misshapen layers of tissues" (p. 276). Whatever the practitioner's point of view during the early years, federal legislation was beginning to mandate services for L D children.

Perceptual training. As a result of early legislation

programs designed for L D children began to proliferate. While some were implemented to address academic skills directly, others were designed to strengthen weak perceptual areas or enhance remaining perceptual abilities. (Teaching to a modality was mentioned at the outset of this paper as it generated heated debate in the field.) One perceptual training program which early practioners became acquainted with was The Frostig Program for the Development of Visual Perception. Perceptual training was proposed to enhance the tracking skills of the disabled reader. Building these skills, it was felt, would enhance reading performance. However, in his address to the Annual Convention of the Council for Exceptional Children, in 1971, Hammill examined the widespread adoption of such procedures. He cited 25 studies done to evaluate perceptual training as it related to improved reading comprehension. Hammill stated:

> Needless to say, these investigation varied widely with regards to statistical expertise, types and number of subjects, number of different trainers, tests used, and overall quality. Surprisingly in twenty-five studies the authors concluded that concomitant improvement in reading cannot be expected as a result of systematic visual-motor training. (p. 8)

The current status of perception as a contributing

factor has more recently been empirically reexamined by Morrison, Giordani, & Nagy (1977). They have observed that reading disabilities have been attributed to perceptual deficits. Yet, they also noted that recent studies by Stanley and Velutino, Steger, and Kandel have "cast doubt on this 'perceptual deficit' hypothesis and pointed to deficits in memory processes" (p. 77). In their experiment, they presented visual stimuli to 12-year-old normal and poor readers for durations which discriminate between perception and memory processes. They found no significant differences between the two groups in perception. In their concluding remarks they stated:

> Taken together, the results of this study showed that poor readers were not deficient in the quantity or quality of information they initially perceived or in the trace duration of that information in a raw perceptual form (VIS). Poor readers did show a striking deficit during the 300 to 2000-msec interval, which argues that reading disability involves some problem in the processing of information in stages following initial perception, perhaps in encoding, organizational, or retrieval skills. Also, reading disability is not limited to verbal materials since poor readers performed equally poorly compared with normal readers on

the geometric and abstract forms. The real difficulty may involve a more abstract ability which underlies processing of both labelable and unlabelable forms. (p. 79)

Language acquisition. The acquisition of language has been indicated as it possibly relates to reading difficulties encountered by L D children (Velutino, 1977). Considering dysfunctions in single or multiple linguistic aspects (syntax, semantics, or phonology) Velutino has written:

> Thus, children who lag behind their peers in general language ability - for example those who have difficulty with grammatic transformational rules, who are unable to make morphopnonemic generalizations, who cannot perceive the syntactic invariants and redundancies characteristic of all natural languages - can be expected to have difficulty in one or more aspects of reading. (p. 349)

Wiig (1982) has stressed the position that language acquisition follows a predictable sequence and the language-learning disabled student typically displays delays in this natural sequence. She has noted that these delays are reflected in a lower verbal score on the WISC-R. Lewis and Kass (1982) have indicated that L D students differ in the quality of semantic labels which they put on common objects, producing significantly less appropriate labels

than their normall; developing counterparts.

In short, it is being suggested that language deficits are reflected in the academic performance of the L D student in two fashions. First, in reading, understanding what is written is limited by the disabled readers' poorer grasp of how language is used to convey meaning in printed form or how print reflects oral communication. Second, the ordering of thought processes reflects directly on acquired language handling skills because these processes are directly involved in the ordering process. Children who exhibit learning disabilities are perceived in this theoretical framework to be affected directly by their developmental language acquisition mastery level.

Classroom instruction. Adelman (1971) has attempted to deemphasize seeking an etiology of L D. He has pointed out that all learners progress at an individual rate and that teaching situations vary in the degree that they meet these rates. Based on this observation he has contended that "the greater the discrepancy between the child's characteristics and the program's characteristics, the greater the likelihood of poor school performance" (p. 529). This position has recently been observed by this writer in a November 16, 1984 workshop on direct instruction, and DISTAR programs, presented by Dr. Phyllis Haddox. In her presentation to Libby, Montana educators, she indicated that proponents of the direct instruction approach

were not directly concerned with understanding the etiology of L D. She added, however, that direct instruction, including the DISTAR programs, has more importantly proven to be an effective instructional means for dealing with these learners in spite of any label or presumed cause.

An emerging pattern - attention deficits. In the inaugural issue of Special Education Today, a magazine intendended to keep pratitioners informed, the writers have stated that "The learning disabled, however, are apparently more susceptible to those stray thoughts of what movie to watch tonight" (Comprehension Monitoring, 1983, p.4). The implication being made here was that these children are less attentive to academic tasks. Summarizing studies done recently on comprehension monitoring this article noted the following points which characterize L D readers as compared to efficient readers:
1.) Efficient readers are better "adept at adjusting their reading style to fit the purpose or the difficulty level of reading material"; 2.) "Good readers spend more time and effort focussing on the major ideas"; 3.) "...efficient readers can sense when it is that they are not understanding what they're reading"; 4.) "Good readers often stop and reread"; and 5.) Efficient readers "know when to use external sources for help" (p. 4-5).

These summarized findings are reflected in the theoretical orientation of Torgesen (1977) who has

questioned the practice of attributing an ability deficit to the L D learner. Referring to studies like that done by Belmont and Butterfield in 1969, which indicated that "brighter and older subjects almost invariabley employ more active acquisition strategies" (p. 28), Torgesen has stressed that disabled learners are less actively involved in the learning process. However, he has questioned if this poorer attending is attributable to a deficit in memory or a lack of effective strategies employed by the learner. Torgesen referred to the analysis of "meta" variables by cognitive psychologists in attempting to understand the component processes used in maintaining attention.

> These variables describe certain relationships which exist between the subject and his task environment, and between the subject and his own cognitive processes. They are usually conceived as pertaining to a general level of cognitive awareness, but there are also strong motivational, personality, and emotional overtones present in various descriptions of them. (Torgesen, 1977, p. 29)

As such, these variables are related to the child's affective and motivational systems which have developed in, and reflect, the home and school environments of which they are a part.

The significant difference between performance and

ability in the definition of L D is explained as the difference between a child's mastery of incidental learning as compared to academic learning. When a child enters the school environment,

> For the first time, he is exposed to a requirement to learn material so that it may be efficiently recalled later. This learning is self-conscious and it often requires that the child associate things which are outside of his natural experience. The relationships are not naturally given; he must generate them. The material is often punctate rather than relational. No longer is it sufficient to merely let things happen; the child must make them happen in very special strategic ways. He must develop efficient study habits, and he must actively create organization and structure. In essence, he must develop and use new techniques of intelligence. (Torgesen, 1977, p. 36)

Referring to another study by Belmont and Butterfield, in which attention was significantly improved when rehearsal strategies were taught, Torgesen (1980) has concluded that this "suggests that failure to apply the strategy spontaneously may have been an important factor leading to the originally deficient performance" (p. 365). Wong (1982) evaluated self monitoring skills employed by L D students and found them significantly less efficient

than those employed by normal and gifted children.

Home factors. In a review of systems used to appraise childrens'disabilities Freund, Bradley, and Caldwell (1979) emphasized the complex nature of the child's environment which contributes to the L D condition. Federally mandated programs to screen children for handicapping conditions have been in place for some time. However, as Freund and his coworkers have pointed out, screenings which do not consider the home life of the diagnosed L D child fail to recognize the myriad factors related to this condition. Assessment measures employed by school systems attempting to screen children are seriously questioned. Inferences have been generated about test outcomes without validation in the home.

Practitioners need to be aware of the multifaceted contribution of the preschool environment to L D in order to more successfully provide instructional alternatives. Of particular interest in this paper is how children perceive their participation and accountability within their world. In examining this issue, Canino (1981) draws upon infrahuman studies in which animals were subjected to aversive reinforcement from which they could not escape. He has summarized these results as impairing "subjects' performance in different setting....The cognitive-motivational-emotional effects involve learning retardation, behavioral

passivity, and heightened physiological distress" (p. 472). Canino has noted that such aversive situations lend credence to the attributional-theory model of Weiner:

> In brief, the model states that a subject's attribution (given its locus of causality, stability, and globality) for the perceived experiences of objective noncontingency is influenced by the subject's expectation for future noncontingency. Expectancy, in turn, influences the generality, chronicity, and type of helplessness felt by the subject. (Canino, 1981, p.472)

Canino described the learned-helplessness theory of Dweek as an expansion of the organism's response to environmental factors. Summarizing research in this area, he pointed to the logical consequences of feeling out of control of one's successes or failures in the academic areas. Factors within the child's home and school become critically important as they contribute to the child's willingness to invest in achieving academic success. In short, the children who perceive the learning situation beyond their ability may have little reason to invest themselves in pursuing academic goals. Those students who perceive that these academic goals are achievable through what they do will be more apt to invest in these pursuits.

Hyperactivity. A remaining theoretical consideration is briefly considered here as it relates to the educator's perspective on the L D child, the phenomenon described as hyperactivity. It has been the experience of this writer that, while not representing a great percentage of the L D children, enough overactive children have crossed the threshold of the resource center to warrant some discussion. In addition, parents and fellow educators use the term hyperactive to describe some of the students who are referred for services. These children can be characterized by their constant movement, constant talking, distractibility or their inability to attend to learning tasks.

Whereas this condition was originally considered to be organically related, more recently writers have suggested that environmental factors may play a prominent role in symptom generation (Barkley, 1981; Cunningham & Barkley, 1978). The effectiveness of drug therapy in treating hyperactivity has been analyzed and found to be effective (Kavale, 1982). However, the negative effects of such treatment should be evaluated and alternatives considered before implementation (Walden & Thompson, 1981).

Barkley (1981) has summarized that treatment procedures which fail to recognize the complexity of this condition will not provide an adequate long term resolution. He has considered drug treatment, in and of itself

to be a narrow approach. It has failed to recognize the contributions of inadequate child-rearing practices. Barkley has advocated a three dimensional approach to dealing with these children that involves the employment of drugs to reduce activity levels, and classroom, as well as home, intervention programs to redirect reinforcement to more appropriate behaviors.

Applications

At the outset it was observed that studying about and working with L D students simultaneously is considered in this paper to be an opportunity. This opportunity has served two major functions in the Libby resource center. First, it has afforded the L D students who receive learning assistance more state-of-the-art programs to accomodate their learning needs. Second, it has provided refreshing mental stimulation among the staff involved with the assessment and teaching of these students.

Strategies and techniques reflecting theoretical orientations described in this paper have been evaluated, some supporting and others contradicting former practices. In this concluding section, the applicability and effectiveness of the "more recent trends" will be discussed. In no way is it implied that the selected approaches and theory applications are universally applicable to L D students. The heterogeneity of this population mitigates against such a proposition. Rather,

it reflects an observation that these programs have been somewhat effective in dealing with a particular group of L D learners (in northwestern Montana) and reflects an awareness of logical theoretical developments in the field. As with the L D definitional issues, the pedagogical implications are subject to change as more current thinking and research are absorbed and accomodated.

Reading as a Process

Since many students have been referred to special services for reading difficulties, it is only fitting that this area should receive primary emphasis in this paper. Learning to read is considered in this resource program to be a twofold process: the mastery of graphophonemic (sound-symbol) cues and the establishment and maintenance of meaning in the reading process. This approach stems from the theoretical bases cited earlier (Johnston, 1983; Pearson & Johnson, 1976) and reflects an emphasis on comprehension skill development (Goodman & Watson, 1977; Pearson & Johnson, 1976) as well as recognizing a need for building word attack skills in begining readers (Eckwall, 1981).

L D students who are having difficulty in reading can be separated into two major groups. The first, generally the younger (kindergarten to second grade students), experiencesdifficulty with the establishment of sound-

symbol relationships. The second, ranging throughout all grades, has difficulty recounting what they have read or what has been read to them. This second group has difficulty finding, storing or reporting what transpires in printed or oral communication in the classroom. A greater percentage of this second group is found in grades three to six. In these grades comprehension difficulty becomes very apparent in all content areas. While it is suggested here that some of the difficulty encountered by this second group relates directly to early graphophonemic problems, good word attack and sound blending ability (i.e. good oral reading) is not a guarantee that students will derive correct meaning from classwork. In fact, some children are good "word callers" but are unable to comprehend what is taught. Our first instructional application will focus on graphophonemic problems.

Younger L D students have a great deal of difficulty with the sounds that individual letters and letter combinations make, as well as the ability to orally blend those individual sounds together. If they have mastered these letter sounds, they may be so slow at combining them that the resultant string has no resemblance to an actual word. Without structured intervention early in the reading process, it is felt that this group of L D children will have tremendous difficulty trying to maintain the learning pace of their peers.

Teaching sounds in isolation is only the most primitive stage in the process of teaching reading. Blending these elements together into meaningful units must occur concurrently for this dimension of the reading process to be useful for the child. Both combining individual sounds to form new words and taking apart known sight words to examine their sound components serves to focus the child's attention on how letters are put together to create written communication.

Valtin (1980) has pointed to work done by Sheerer-Newman which contends that children have difficulty with this facet of the reading process because of an "uneconomical segmentation strategy". Thus, the goal for instruction ought not to be having these children become able to generate sound-symbol relationships in a one-to-one manner, but rather, the special educator should strive to develop in the child the ability to automatically recognize larger letter combinations. This approach lends some support to reading programs which have been called "linguistic" (e.g. The Merrill Linguistic Reading Program & The S R A Reading Program). These programs teach word groups which resemble each other in letter configuration (e.g. hold, told, bold, etc.) Both programs are recommended here for L D students who are beginning to understand beginning and ending sounds.

Sight word recognition must also be built concurrently

with sound blending skills. The goal is to move as rapidly as possible into the "making sense" dimension of reading. Having the Dolch or Fry high frequency word lists at the automatic response level serves to provide the child with a necessary tool in dealing with print efficiently (Fry, 1980). Timed daily drill on these and other subject relevant words is also recommended in building this base word vocabulary.

Attention and Comprehension

Given the fact that the child has average mental ability, it is argued here that employing these reading strategies early with L D students will reduce later problems substantially. However, factors which have the potential to work against academic success in general, and reading success in particular, throughout the educational process are the L D child's attentiveness and lack of motivation.

The instructional posture advocated with relation to attention reflects that of Torgesen (1982). Recalling that he has characterized the L D learner as inactive, it should be the goal of instruction to maintain attention at all costs. To the degree that attentiveness is a problem is the degree that group size should be small, preferably one-to-one for first and second graders who are prone to distractibility. When attention wanes, the teacher must bring the child back on task. The

combination of groups of letter sounds is impossible when the time interval between the components becomes too great.

Similarly, since comprehension has been described as an active process intertwined with the memory process (Royer & Cunningham, 1978), L D students can hardly be expected to recall information in science, for instance, if their attentional habits do not foster such activity. Some methods suggested here as effective instruction are moving as quickly as possible through material that needs to be explained, constant drilling over facts and information that has been recently introduced, constant review and repetition of main ideas, using drawings (crude though they may be) that depict information being studied, and orally drawing attention to and describing the learning process necessary for mastering academic material. Each of the above activities has value to the extent that the material is appropriately sequenced to reflect manageable segments for the learner.

In evaluating these recommendations, one can see a striking resemblance between the suggested activities and those recommended by proponents of direct instruction (e.g. Engleman & Carnine, 1982; Lewis, 1983). However, the argument that special educators should use a program "because works" and not because it tends to add information to the general body of knowledge about a specific

condition is not being advocated here. Rather, there are some principles, fundamental to task analysis and direct instruction which make sense in light of the theoretical considerations described earlier, particularly in the work of Torgesen. It would be foolish to discard an effective instructional approach because it does not recognize the L D child as having a specific identifiable disorder.

Teaching the Comprehending Process

Another consideration reflects recent developments in the area of cognitive behavior modification. Several writers have suggested tuning students into their own thinking processes in an attempt to improve their academic performance (Finch & Spirito, 1980; Lloyd, 1980; Loper, 1980; Meichenbaum, 1979). The analysis of meta variables was briefly considered in the special education section of this paper. Employing such analyses of task related thinking implies that thinking processes can be improved through a greater awareness of these processes and the teaching of more effective strategies for using them.

L D children appear to have inefficient strategies for retrieving information (Wong, 1982). What is being suggested is employing training in the development of more successful learning strategies. To begin, for the children who perceive their difficulty as arising from factors beyond their control, it permits them a tool for directing

their academic success. While packaged cognitive behavior modification programs are not currently available in special education the components should probably include these self-monitoring and rehearsal strategies.

To begin, L D children must be instructed how to monitor if their attention is straying. Self-questioning like "Am I paying attention?" or "What is the teacher doing?" should be the focus. Monitoring what the task requires should follow next: "What am I expected to get from this lesson ? Am I getting it?" As a result, the child becomes aware of the central role attention plays in the learning process and is afforded the opportunity to see that attending enables them to learn more easily. Not only do the children become more aware of their contribution to their own success, but also these techniques are effective tools in the learning process.

Lloyd (1980) has suggested that the most central aspect of chis instructional process, which fosters improved comprehension, is modeling these strategies by the instructor and not directly teaching self-verbalization or questioning strategies. Activities in which the special educators orally go through the process of reaching a conclusion, putting together the letter clues in a word, manipulating numbers in an arithmetic problem, in general taking "their turn" at answering questions are encouraged without reservation. This process not only demonstrates for

the student the component thoughts that contribute to successful academic achievement, but it also maintains attention for both the student and teacher. That, if nothing else, is what is being suggested as the main educational strategy for the L D student, maintaining attention. Torgesen's theory, like no other, has influenced the position taken here for providing services to L D students. Not only is it simple and logical, but it affords the special educator a perspective which can be employed with almost any type of material. The teaching task becomes one of defining the information that is important and needs to be learned, breaking it down into manageable and meaningful segments, and getting the child's attention so that learning can take place. It should come as no surprise that these same components comprise many good educational programs.

One remaining issue for the practitioner comes from the area of developmental psychology. T eachers who are unaware of the developmental stages that children predictably pass through may be prone to expecting more of their students than they are capable of giving. Developmental lags may be apparent in the L D student in particular. What accomodations need to be made in this regard?

To begin, the practioner must be sensitive to the fact that developmental stages are not directly taught but

heuristically developed, that is, they are a product of the child's interactive involvement within the environment (Pulaski, 1971). Here is where the direct instruction approach pales somewhat in light of the contribution of experiences. Children learn a great deal about their world by interacting with it. Similarly, in our discussion of script theory, it was contended that learning is a result of accomodating new information within the network of the mind, the association of new with existing data.

It would be difficult for most readers of this paper to understand how a capacitor in their color television set or computer terminal holds an electronic charge without some reference to how a diaphram can yield to accept the pent up force of a directed amount of water. For L D students, whose teachers refer them for academic assistance because they are unable to understand parts of speech, how photosynthesis works, what the main idea of a story is, what the topic sentence of a paragraph may be, etc. there may oe two reasons. Assuming they are sufficiently motivated, either they are unable to employ strategies for evealuating and retaining the information or they may not have the experiential base against which to relate the new material.

The role of the practitioner at this juncture is to be a sensitive evaluator of what the child does and does not know. What, in the informational/experiential

background can be related to the new data? This position provides an argument for evaluative teaching as part of the screening process for high-risk candidates. It is suggested here that when this becomes the case, instruction can proceed more successfully.

The chalkboard has proven to be an invaluable tool in serving as a monitor for showing rough drawings, graphs, charts, timelines, examples, words that may relate to other words, models, etc. which enables the teacher to present information and modify it in response to lesson development and the student's questions. A more effective procedure for working one-to-one is using a tablet in place of the chalkboard to construct the lesson components and their relationship to existing knowledge. In this way, the student is permitted to relate back to this format as they prepare for tests on the material covered in the regular class program. The strategy of generating meaningful notes and using words and pictures will enhance the L D student's learning in all areas throughout school. Not only does teaching via this strategy, directly and through modeling, enable these students to generate meaning for meaningless data, but it also serves to focus their attention on the learning task at hand. As the position taken in this paper has emphasized, when the L D student becomes aware of the fact that they can directly affect their classroom

success, a major step in breaking the failure syndrome is achieved. When these techniques are proven to be effective, the child is better equipped to succeed in achieving academic goals.

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